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Dynamics of two coupled vortices in a spin valve nanopillar excited by spin transfer torque

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Abstract

We investigate the dynamics of two coupled vortices driven by spin transfer. We are able to independently control with current and perpendicular field and to detect the respective chiralities and polarities of the two vortices. For current densities above J=5.7× 107 A/ cm 2, a highly coherent signal (linewidth down to 46 kHz) can be observed, with a strong dependence on the relative polarities of the vortices. It demonstrates the interest of using coupled dynamics in order to increase the coherence of the microwave signal. Emissions exhibit a linear frequency evolution with perpendicular field, with coherence conserved even at zero magnetic field. © 2011 American Institute of Physics.

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